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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/894,874

06/29/2001

Soon Sung Yoo

041501-5432

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05/05/2005

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EXAMINER

KIELIN, ERIK J

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

E/C

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/894,874	YOO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Erik Kielin	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 6-9, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) none is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-9, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24 February 2004 has been entered.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 6-9 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 6 recites the limitation "the pad" in the last line. There is insufficient antecedent basis for this limitation in the claim. The remaining claims, 7-9 are rejected for depending from the above rejected claims. For the purposes of patentability, the claims will be interpreted as best understood.

5. Claim 20 is indefinite because the limitation "a second portion of the substrate" (emphasis added) has been twice used, a first time to define the location of the "grinding area" and a second time to define the location of "a pad contact area." The claim also requires the pad contact area to be located **between** the active region and the grinding area, so it is unclear if both

“a second portion” features can be the same. For the purposes of patentability, the claims will be interpreted as best understood; specifically, the second occurrence of “a second portion” will be taken to be a third portion since it does not appear that it can be the same portion as the grinding area located at the second portion.

*Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,966,589 (**Watanabe** et al.) in view of US 6,016,174 (**Endo** et al.) and US 5,492,582 (**Ide** et al.).

Regarding claim 6, **Watanabe** discloses a pad structure for a liquid crystal display, comprising:

a substrate **18** (Figs. 4-6: Figs. 5 and 6 are cross-section of Fig. 4);

a tape carrier package layer **3, 5, 9, 12, 13, 14, 15**;

a plurality of gate pads and data pads **3, 5, 9** formed on the substrate **18**, each having a “pad contact area and an anisotropic conductive film deposit area” (col. 9, lines 51-64) --as recited in the preamble of instant claim 6--

an insulating film **13, 14, 15** formed on surfaces of the gate pads and data pads **3, 5, 9** and therefore in the “pad contact area,” the insulating film defining a plurality of contact holes **10a, 10b, 10c**, therethrough;

a plurality of transparent conductive layers **12** electrically connected to the gate pads and the data pads **3, 5, 9** through the contact holes **10a, 10b, 10c** (Figs. 4-6); and

an anisotropic conductive film (not shown) formed on the transparent conductive layers **12** and therefore “on a lower portion of the tape carrier package layer and covering the pad contact area of the liquid crystal display” in order provide electrical connection between the TFT/pixel array and the driving circuit (the driving circuit also not shown; col. 9, lines 51-64),

wherein the entire upper, side, and end surfaces of the gate and data pads are completely covered by the insulating film **13, 14, 15** and the transparent conductive layer **12**.

**Watanabe** does not indicate the extent of coverage of the transparent conductive layers **12** and the insulating layers **13, 14, 15** of the tape carrier package layer with the anisotropic conductive film.

**Endo** teaches tape carrier package (TCP) LCD having a pad structure on the LCD substrate similar to that in **Watanabe** for a liquid crystal display including a plurality of gate pads and data pads **20, 24** formed on the substrate (Figs. 3, 4, and 14; col. 14, lines 18-27); an insulating film **3, 8** formed on surfaces of the gate pads and data pads **20, 24**; a plurality of transparent conductive layers **22, 26** formed of indium tin oxide electrically connected to the gate pads and the data pads **20, 24** (col. 19, lines 9-61) through contact holes in the insulating films **3, 8**; and an **anisotropic conductive film**, ACF, formed on the transparent conductive layers **22, 26** to cover entire upper and side surfaces of the transparent conductive layers (not shown but expressly indicated at paragraph bridging cols. 11-12 --especially the last sentence-- and at col. 23, lines 9-42 --especially the last two sentences). In this regard, **Endo** states,

“In this event, as shown in FIG. 3 and FIG. 4, ACF is placed at the position **completely covering the first TCP terminal contact 22 and**

**the second TCP terminal contact 26**, that is, the first TCP connecting range 23 and the second TCP connecting range 27. By doing so, the contact hole level difference portion of the TCP terminal portion is covered with ACF, and even when crack, etc. are generated in the conductive thin film at the level difference portion, the display portion lead-out electrode is no longer exposed to humidity in the atmosphere, and the corrosion by humidity can be prevented.” (Emphasis added.)

Therefore, the ACF of **Endo** must necessarily be disposed on the insulating film **3, 8**, in order to completely cover the terminal contact. In other words, if the ACF were not disposed on a portion of the insulating film **3, 8**, then the terminal contact would not be completely covered, contrary to the teaching in **Endo**.

Accordingly, it would have been obvious for one of ordinary skill in the art, at the time of the invention to cover the entirety of the upper and side surfaces of the transparent conductive film **12** of **Watanabe** with the anisotropic conductive film so as to extend onto the insulating film **13, 14, 15**, in order to provide reliable electrical connection to the pads **3, 5, 9** while protecting the connection from damage and corrosion due to humidity, as taught to be beneficial in **Endo**. Further in this regard, note that the gate and data **3, 9** pads shown in the Fig. 7N of **Watanabe** having ITO contact portions **12** having ends. **Endo** shows in Figs. 3 and 4 and states --as in the excerpt above-- that the ACF extends beyond the contact holes, “completely covering” the first and second terminal over the “connecting range” to prevent damage from humidity. Accordingly, it would have been obvious for one of ordinary skill in the art, at the time of the invention to cover the entire ITO structure in **Watanabe** by ACF, in order to prevent damage from humidity, as taught by **Endo**.

Then the only difference is that **Watanabe** in view of **Endo**, do not teach the use of a grinding area or its proximity to the gate and data pads are separated from the grinding area by a predetermined distance.

**Ide** teaches a method of mass producing LCDs, wherein an insulating film portion **11a** is removed from the grinding area (Figs. 2A-3C) before separating the LCDs. **Ide** teaches that this method allows automation of the process and prevents breakage of the LCDs (col. 1, line 55 to col. 2, line 10).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to mass produce the LCDs of **Watanabe** in view of **Endo**, in order to save time and money, and thereby to provide a grinding area to separate the mass-produced LCDs. It would further have been obvious for one of ordinary skill in the art, at the time of the invention to both provide the grinding area at a predetermined distance from the gate and data pads because **Endo** teaches that the pads should be completely covered to protect them from humidity-induced corrosion, such that one of ordinary skill would know to place the grinding area away from the pads of the such that they are not damaged during separation.

Regarding claim 7, **Watanabe** discloses that the insulating film **13-15** is formed on side surfaces and upper parts of the gate and data pads **3, 5, 9**.

Regarding claim 8, **Watanabe** discloses that the gate and data pads **3, 5, 9** are formed on a substrate **18**, and the insulating film **13-15** --particularly **14**-- contacts the substrate at end portions of the gate pads and data pads **3, 5, 9**.

Regarding claim 9, **Watanabe** discloses that the gate insulating film **14** is formed between the gate and data pads **3, 5, 9** (Figs. 4-6).

8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over by US 6,310,667 B1 (**Nakayoshi** et al.) in view of US 5,492,582 (**Ide** et al.).

Regarding claim 19, **Nakayoshi** discloses a pad structure for a liquid crystal display, comprising:

- a substrate **SUB1** (Figs. 5(a)-5(c));
- at least one pad (see NOTE below) formed on the substrate **SUB1** (Figs. 5(a)-5(c));
- an insulating film **GI, PSV1** formed on the pad, the insulating film entirely covering the side and end surfaces of the pad and a portion of the substrate **SUB1** adjacent to the side surfaces of the pad (Figs. 5(a)-5(c)); and
- at least one conductive layer **ITO1** connected to the pad through contact holes defined through the insulating film **GI, PSV1**, wherein the pad is separated from the grinding area **GCUT1, GCUT2, GCUT3, GCUT4** by a predetermined interval (Fig. 5(c)).

NOTE: The pads are taken to be those portions of the data lines **DL1, DL2, etc.**, and gate lines **GL1, GL2, etc.** directly beneath and not extending beyond the area labeled as drain inspection terminals **DTM** (as **DTM1, DTM2, etc.**) and gate inspection terminals **GTM** (as **GTM1, GTM2, etc.**). This is consistent with the specification and figure in **Nakayoshi** because **DTM** and **GTM** are the pad contact areas. (See Figs. 5(a)-5(c); col. 15, line 6 to col. 16, line 12.)

Regarding claim 20, **Nakayoshi** discloses a liquid crystal display formed on a substrate **SUB1**, comprising:

- an active region **GSO** defined at a first portion of the substrate **SUB1** (Figs. 5(a)-5(c));



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a grinding area **GCUT1, GCUT2, GCUT3, GCUT4** defined at a second portion of the substrate **SUB1**;

a pad contact area (see NOTE above) defined on "a second portion" of the substrate **SUB1** between and adjacent to each of the active region **GSO** and the grinding region **GCUT1, GCUT2, GCUT3, GCUT4**, the pad contact area **DL1, GL1, etc.** including:

at least one pad formed on the substrate **SUB1**,

an insulating film **GI, PSV1** formed on the pad,

at least one conductive layer **ITO1** connected to the pad through contact holes defined through the insulating film **GI, PSV1**, wherein the insulating film **GI, PSV1** covers the entire side and end surfaces of the pad and a portion of the substrate **SUB1** adjacent to the side and end surfaces of the pad, such that the conductive layer **ITO1** is not formed in the grinding area **GCUT1, GCUT2, GCUT3, GCUT4**, as shown in Figs. 5(a)-5(c), and

wherein the pad is separated from the grinding area **GCUT1, GCUT2, GCUT3, GCUT4** by a predetermined interval.

As applied to each of claims 19 and 20 above, **Nakayoshi** does not indicate that the insulating film **GI, PSV1** is not formed in the grinding area.

**Ide** teaches a method of mass producing LCDs, wherein an insulating film portion **11a** is removed from the grinding area (Figs. 2A-3C) before separating the LCDs. **Ide** teaches that this method allows automation of the process and prevents breakage of the LCDs (col. 1, line 55 to col. 2, line 10).

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It would have been obvious for one of ordinary skill in the art, at the time of the invention to leave the insulating film off of the grinding area in **Nakayoshi**, in order to automate the process and not break the substrates.

### *Response to Arguments*


9. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached from 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Erik Kielin  
Primary Examiner  
May 3, 2005